

coaxial polymer layer at a proximal portion of the variable stiffness optical fiber shaft, such as by adhesive, and for example by cyanoacrylate adhesive. Similarly, a coaxial strain relief member 120 can also be attached over the proximal portion of the optical fiber shaft, adjacent to and distal to the connecting hub. ~~a hub attached over a proximal portion of the optical fiber~~

IN THE CLAIMS:

Claim 1. (Previously amended) A variable stiffness optical fiber shaft for use in interventional therapy, comprising:

an optical fiber having a proximal end and a distal end;

a tapered reinforcing tube bonded to said optical fiber, said optical fiber extending therethrough, the reinforcing tube having a thickness that varies over the length of the reinforcing tube; and

a reinforcing braid attached over said optical fiber and over a distal portion of said reinforcing tube.

Claim 2. (Original) The variable stiffness optical fiber shaft of Claim 1, further comprising a radiopaque marker attached to said optical fiber.

Claim 3. (Original) The variable stiffness optical fiber shaft of Claim 1, further comprising a shape memory collar attached over said distal end of said optical fiber.

Claim 4. (Original) The variable stiffness optical fiber shaft of Claim 3, further comprising a distal sheath connected to said distal end of said optical fiber and extending over a portion of said shape memory collar.

Claim 5. (Original) The variable stiffness optical fiber shaft of Claim 1, wherein said optical fiber comprises a covering of an outer buffer, and wherein said outer buffer is removed from a distal portion of said optical fiber.

Claim 6. (Original) The variable stiffness optical fiber shaft of Claim 1, further comprising a connecting hub attached over a proximal portion of said optical fiber.

Claim 7. (Original) The variable stiffness optical fiber shaft of Claim 6, wherein said connecting hub is attached over said proximal portion of said optical fiber with adhesive.

Claim 8. (Original) The variable stiffness optical fiber shaft of Claim 6, further comprising a strain relief member attached over said proximal portion of said optical fiber.

Claims 9-11 (Cancelled)

Claim 12. (Original) The variable stiffness optical fiber shaft of Claim 1, further comprising a reinforcing coil attached over said optical fiber and under a distal portion of the reinforcing tube.

Claim 13. (Original) The variable stiffness optical fiber shaft of Claim 1, further comprising a strain relief member attached over said proximal portion of said optical fiber.

Claim 14. (Original) The variable stiffness optical fiber shaft of Claim 1, wherein said reinforcing braid is formed of stainless steel.

Claim 15. (Original) The variable stiffness optical fiber shaft of Claim 2, wherein said radiopaque marker is attached to said distal portion of said optical fiber.

Claim 16. (Original) The variable stiffness optical fiber shaft of Claim 15, wherein said radiopaque marker comprises a platinum wire coil.

Claim 17. (Original) The variable stiffness optical fiber shaft of Claim 3, wherein said shape memory collar is attached over said distal end of said optical fiber by adhesive.

Claim 18. (Original) The variable stiffness optical fiber shaft of Claim 4, wherein said distal sheath is formed of polyethylene.

Claim 19. (Original) The variable stiffness optical fiber shaft of Claim 4, wherein said distal sheath is formed from said at least one layer of heat shrink material over said distal end of said optical fiber.

Claim 20. (Previously amended) A method of constructing a variable stiffness optical fiber shaft comprising the steps of:

providing an optical fiber, said optical fiber having a proximal end and a distal end;

bonding a tapered reinforcing tube to a proximal portion of said optical fiber, said optical fiber extending through said reinforcing tube, the reinforcing tube having a thickness varying over the length of the reinforcing tube; and

applying a reinforcing braid over a middle to distal portion of said optical fiber.

Claim 21. (Original) The method of Claim 20, further comprising the step of attaching a radiopaque marker to a distal portion of said optical fiber.

Claim 22. (Original) The method of Claim 20, wherein said step of applying a reinforcing braid comprises disposing a proximal portion of said reinforcing braid over a distal portion of said reinforcing tube.

Claim 23. (Original) The method of Claim 20, further comprising the step of attaching a shape memory collar over said distal end of said optical fiber.

Claim 24. (Cancelled)

Claim 25. (Original) The method of Claim 20, wherein said optical fiber is covered with an outer buffer, and further comprising the step of removing said outer buffer from a distal portion of said optical fiber.

Claim 26. (Original) The method of Claim 20, further comprising the step of attaching a connecting hub over a proximal portion of said optical fiber.

Claim 27. (Original) The method of Claim 26, wherein said step of attaching a connecting hub comprises bonding said connecting hub over a proximal portion of said optical fiber with adhesive.

Claim 28. (Original) The method of Claim 20, further comprising the step of attaching a strain relief member over said proximal portion of said optical fiber.

Claim 29. (Original) The method of Claim 20, further comprising the step of polishing the proximal end of the optical fiber for connection of said proximal end of the optical fiber to an optical fiber ferrule.

Claim 30. (Cancelled)

Claim 31. (Original) The method of Claim 20, further comprising the step of applying a reinforcing coil over said optical fiber.

Claim 32. (Original) The method of Claim 21, wherein said radiopaque marker comprises a platinum coil.

Claim 33. (Original) The method of Claim 23, wherein said step of attaching a shape memory collar comprises bonding said shape memory collar to said distal end of said optical fiber with adhesive.

Claim 34. (Original) The method of Claim 24, wherein said step of attaching a distal sheath comprises attaching a distal sheath formed from a material selected from the group consisting of polyethylene, polytetrafluoroethylene, and polyethylene terephthalate over said distal end of said optical fiber and over a portion of said shape memory collar.

Claim 35. (Original) The method of Claim 31, wherein said step of applying a reinforcing coil comprises applying said reinforcing coil over a distal portion of said optical fiber and under a distal portion of said reinforcing tube.